

Impact of Covid-19 Pandemic on Gender Wage Gap in Indonesia

(Perubahan Kesenjangan Upah Antar Gender Terkait Pandemi Covid-19 di Indonesia)

Meylan Ratnawati Panjaitan

Universitas Indonesia

e-mail: meylan.ratnawati@ui.ac.id

Abstract

Female workers in many countries experience the worse decline in employment and income compared to men, it is essential to measure the impact of the Covid-19 pandemic on the gender inequality in the workplace in Indonesia. This study uses SAKERNAS 2019-2021 data to investigate the employment condition and the wage gap across genders before and during the Covid-19 pandemic by employing OLS to examine the wage determinants and Blinder-Oaxaca to decompose the wage gap. In contrast with the phenomenon in other countries, the result of the study reports that the wage gap in Indonesia slightly decreases during the Covid-19 pandemic. However, further analysis with t-tests and z-test on wage gap comparisons among business sectors and provinces find no evidence that the wage gap across genders changes significantly due to the Covid-19 pandemic.

Keywords: Gender Wage Gap, Employment, Indonesia, Covid-19 Pandemic, OLS, Blinder-Oaxaca.

Abstrak

Pekerja perempuan di banyak negara mengalami penurunan pekerjaan dan pendapatan yang lebih buruk dibandingkan laki-laki, pentingnya mengukur dampak pandemi Covid-19 terhadap ketidaksetaraan gender di dunia kerja di Indonesia. Studi ini menggunakan data SAKERNAS 2019-2021 untuk menyelidiki kondisi ketenagakerjaan dan kesenjangan upah lintas gender sebelum dan selama pandemi Covid-19 dengan menggunakan OLS untuk memeriksa faktor penentu upah dan Blinder-Oaxaca untuk menguraikan kesenjangan upah. Berbeda dengan fenomena di negara lain, hasil studi melaporkan bahwa kesenjangan upah di Indonesia sedikit menurun selama pandemi Covid-19. Namun, analisis lebih lanjut dengan uji-t dan uji-z pada perbandingan kesenjangan upah antara sektor bisnis dan provinsi tidak menemukan bukti bahwa kesenjangan upah antar jenis kelamin berubah secara signifikan akibat pandemi Covid-19.

Kata kunci : Kesenjangan upah antar gender, ketenagakerjaan, Indonesia, Pandemi Covid-19, OLS, Blinder-Oaxaca.

1. Introduction

The global economy has declined since the Covid-19 pandemic spread in early 2020. A report by the Economist Intelligence Unit (2021: p.1) describes that despite the efforts made by governments in all countries to tackle the drawbacks caused by the global outbreak of the virus through fiscal and monetary stimulus, its impacts have put the economic long-run growth sustainability in uncertainty. According to the World Bank report (2020: pp. 3-4), many countries experience a recession due to the contraction of output per capita growth to 5.2 percent globally. In Indonesia, BPS (2020) reports that around a third of companies have to terminate a number of their workers, causing a rise in the unemployment rate in the country. Some companies reduce their workers' working hours to lower labor costs, which consequently causes a decline in their output production. The working hours reduction may also lead to a decrease in the wages. Moreover, in a report by Indonesia Business Coalition for Women Empowerment (IBCWE, 2021), more than 50 percent of total workers in the private sector receive a wage deduction as a consequence of working hours reduction, especially the hospitality industry such as hotels and restaurants that are severely affected by activity restrictions during the pandemic. Women are the majority who endure income loss during the pandemic since hotels and restaurants hire more women employees.

Notwithstanding the absence of the Covid-19 pandemic, women have endured lower payments in the labor market. Existing empirical studies show that unobserved factor is still a substantial indication of lower wages earned by female workers (Laili & Damayanti, 2019; Hennigusnia, 2014; Vibriyanti, 2013; Oaxaca, 1973; Blinder, 1973). Additionally, these studies also find some reasons women are waged lower than men, for example, the unequal distribution of working hours (Doiron & Barret, 1996) and unequal distribution of occupations (Blinder, 1973, p.449). Furthermore, Scholars have conducted studies to analyze the wage gap between men and women in the Indonesian labor market. Laili and Damayanti (2019) report that in non-exporting manufacturing companies, women earn significantly lower than men despite the same productivity. Meanwhile, in exporting manufacturing companies, both genders earn equally based on their productivity. To continue, Vibriyanti (2013), also using SAKERNAS data from 1980-2013, shows that there is wage discrimination against women in the labor market because female workers are waged 30 percent lower than male workers.

Another study by Hennigusnia (2014), employing SAKERNAS data from 2008 to 2012, indicates that gender discrimination is responsible for the wage gap between male and female workers in Indonesia. She also finds the "sticky floor effect," a phenomenon where the wage gap between men and women is widening in the lower-paying job categories specified in the informal sectors. Other developing countries such as Sri Lanka, and Thailand also indicate the "sticky floor effect" (Gunewardena et al., 2008; Adireksombat, Fang, Sakellariou, 2010). By contrast, developed countries face the phenomenon more likely known as the "glass ceiling effect" (Weinberger, 2011; and Yamaguchi & Youm, 2016). The "glass ceiling effect" indicates "an invisible ceiling blocking the entry of women into high-level positions in firms or organizations" (Yamaguchi & Youm, 2016).

Existing theories argue about the cause of the wage gap between male and female workers in the labor markets, namely gender role theory and devaluation theory. The former stresses the distinction in gender roles attached to a human from a very young age and determine their function at home, personal relationship, family life, school, and employment. This view urges men and women to walk a different path in education and employment, which is key to the wage gap. However, the preference is not always taken consciously by the person; it is often forced by social pressures continuously through generations (Brynin, 2017: 16). A cultural tradition that expects women to be responsible for domestic work and take care of family accounts for the decrease in female working hours, therefore lead to lower wage compared to men and further widens the gender wage inequality. Aligned with this view, an empirical study by Erosa, Fuster, and Restuccia (2016) assumes that having children reduces working hours more for women than men, and it becomes one of the factors widening gender wage inequality.

Meanwhile, devaluation theory assumes that "women are culturally devalued in society" (Magnusson, 2008, p. 87), and thus, society undervalues certain types of work associated with women and underpays women's work. Female-typical occupations such as caring, nursing, nurturing, and providing services are economically valued less than male-typical occupations. This undervaluation contributes to the wage inequality between female and male workers. Freeland and Harnois (2020) distinguish the measures of gendered cultural sentiment, namely "evaluation (goodness, caring, warmth) and potency (power, strength, competence)." Their analysis reports that only 'potency' impacts the occupational income net. The cultural belief system that highly values 'potency' associated with masculinity leads to higher occupational reward than feminine nurturing occupations associated with 'evaluation.'

Previous studies supported by existing theories have shown the existence of a wage gap across genders for a long time. However, there are only a few studies in Indonesia which discuss about the gender wage gap, particularly about the impact of the Covid-19 pandemic on income disparity between genders. Thus, to enrich the literature about gender inequality in Indonesia, this study examines the change in the wage gap before and during the Covid-19 pandemic in Indonesia. In addition, this paper also investigates the change in the employment situation in Indonesia before and during the Covid-19 pandemic. The result of this study aims to provide a scientific analysis based on an empirical data as a basis for policy making in order to tackle the issue of gender inequality in Indonesia specifically in labor market.

2. Data and Method

The data for this study is from The National Labor Force Survey (SAKERNAS) conducted by Statistics Indonesia (BPS) before the outbreak of the Covid-19 pandemic in August 2019 and the aftermath in August 2020 and August 2021. The eligible samples for this study are individuals whose status is "Employee," totaling 504.084 individuals from 2019 to 2021 distributed in 17 sectors and 34 provinces. This study constructs a monthly wage regression and uses Ordinary Least Square (OLS) to examine the monthly wage determinants by using variables year, age, gender, marital status, area classification, education, tenure, occupation, working hours, business sector, and province to determine the endowment factors in wage. Nevertheless, the endogeneity problem in these regression models may appear from some sources of variables.

The wage regression: $\ln MWage_i = \beta_0 + \beta_1 Year_i + \beta_2 Age_i + \beta_3 Female_i + \beta_4 Married_i + \beta_5 Urban + \beta_6 Education_i + \beta_7 Tenure_i + \beta_8 Occupation_i + \beta_9 WH_i + \beta_{10} Sector_i + \beta_{11} Province_i + \epsilon_i$

To formalize the notion of discrimination in wage between male and female workers, Oaxaca and Blinder refer to the concept of a market discrimination coefficient (D) suggested by Becker in 1971, which is the difference between the observed wage ratio of male and female (W_m/W_f) and the wage ratio in the absence of discrimination ($(W_m/W_f)^0$), which is written as follow:

$$D = \frac{(W_m/W_f) - (W_m/W_f)^0}{(W_m/W_f)^0} \quad (1)$$

With the assumption that in a non-discriminative labor market, employers apply the cost minimization principle, thus $\left(\frac{W_m}{W_f}\right)^0 = \frac{MP_m}{MP_f}$ where MP_m and MP_f are the marginal products of males and females, respectively.

Then, the Blinder-Oaxaca decomposition for linear regression will estimate the wage gap between male and female workers and its decompositions. The wage estimation is calculated individually for male and female workers with the semi-log functional form:

$$\ln(W_i) = Z'_i \beta + \epsilon_i \quad (2)$$

for which

W_i : the hourly wage rate of the i -th worker

Z'_i : a vector individual characteristics

β : a vector of coefficients

ϵ_i : a disturbance term

Let the male-female gross wage difference (G) is written as follow:

$$G = \frac{W_m - W_f}{W_f} \rightarrow (G + 1) = \frac{W_m}{W_f} \quad (3)$$

where W_m and W_f are the hourly wages for males and females, respectively.

Then, let Q formulates the male-female wage difference in the absence of discrimination, where workers are paid according to their productivities which are determined by their endowment factors, $W_m^0 = MP_m$ and $W_f^0 = MP_f$.

$$Q = \frac{W_m^0 - W_f^0}{W_f^0} \rightarrow (Q + 1) = \left(\frac{W_m}{W_f}\right)^0 \quad (4)$$

Therefore, the discrimination coefficient in (1) becomes:

$$D = \frac{(W_m/W_f) - (W_m/W_f)^0}{(W_m/W_f)^0} \rightarrow (D + 1) = \frac{(G + 1)}{(Q + 1)} \quad (5)$$

Equation (5) can be written in logarithmic forms:

$$\ln(G + 1) = \ln(Q + 1) + \ln(D + 1) \quad (6)$$

Equation (6) shows that *the gross wage difference* is decomposed by *the endowment effects* and *the discrimination effects*.

3. Result and Discussion

3.1. Employment Situation in Indonesia

Table 1 displays the means of variables for each gender. All genders experienced a decrease in weekly working hours, thus they earned less during the Covid-19 pandemic in 2020 and 2021. Even though in 2020 and 2021, the average wage of male workers decreased, the gap remains about the same proportion since women also experienced decreasing wages during the pandemic. Rahman, Kusuma, and Arfyanto (2020) report that the economic sectors most severely affected by the Covid-19 pandemic are occupied by informal workers whose jobs cannot be accommodated by working remotely. Since a large number of informal workers were laid off when the Covid-19 virus outbreak, it is most likely that the workers' distribution in the labor market will be restructured where formal workers with little gender wage gap dominate the labor market. Therefore, the wage gap appears to be shrinking temporarily.

Table 1 Characteristics Comparison between Genders 2019-2021

Variable	2019			2020			2021		
	Male	Female	p value Male vs Female	Male	Female	p value Male vs Female	Male	Female	p value Male vs Female
Monthly Wage	3,029,263	2,343,638	0.000	2,881,377	2,268,445	0.000	2,847,466	2,251,908	0.000
Hourly Wage	17,828	15,506	0.000	20,241	20,024	0.197	20,534	19,872	0.001
Weekly Working Hours	45.84	40.43	0.000	41.95	35.96	0.000	42.64	36.10	0.000
Age	37.86	36.25	0.000	38.03	36.81	0.000	38.24	36.92	0.000
Tenure	8.14	7.39	0.000	8.66	8.06	0.000	8.70	8.13	0.000
Marital Status	0.73	0.64	0.000	0.74	0.65	0.000	0.73	0.64	0.000
Education	2.68	3.23	0.000	2.77	3.32	0.000	2.78	3.35	0.000

Source: Stata output from SAKERNAS data

Furthermore, male workers have significantly longer working hours per week which may be one of the reasons they earn higher wages than women. However, during the pandemic, both genders experienced a reduction in working hours, leading to a drop in earnings. There is also a significant difference in age and tenure variables which show that, on average, the men are generally older and have worked longer than women. In terms of the marriage variable, male workers are more likely to be married while the proportion of married women in labor market is less than that of men. The socio-cultural factors in Indonesia engender female workers to face considerable physical obstacles because their household responsibilities and a limited number of jobs suitable for women hinder them from participating in the labor market. The social narrative that a woman's duty is managing the domestic chores at home while her job in the labor market is only a side job has burdened her with double responsibilities. Thus, she implicitly indicates that she has less time to dedicate herself to her job than male workers. Consequently, women are seen as less productive and less promising to employers (International Labour Organization, 2013).

However, on average, women have a higher education level than men. It does not mean that, in general, women are more educated than men, but women who enter the labor market are more likely to be more educated than unemployed women. Meanwhile, men of all levels of education tend to have jobs because the social paradigm in Indonesia expects men to be the provider in the family.

Table 2 The Number of Workers by Education Level 2019-2021

Education	2019 (Weighted)			2020 (Weighted)			2021 (Weighted)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
No Diploma	1,940,138	955,698	2,895,836	1,122,734	669,083	1,791,817	1,308,079	716,678	2,024,757
Elementary School	5,285,984	2,171,094	7,457,078	4,705,468	2,023,564	6,729,032	4,560,180	1,942,004	6,502,184
Junior High School	5,664,701	2,384,157	8,048,858	4,869,610	1,985,704	6,855,314	4,792,163	2,106,046	6,898,209
Senior High School	14,717,575	6,462,127	21,179,702	13,340,923	5,698,627	19,039,550	14,343,490	6,331,988	20,675,478
Vocational School	1,118,745	1,418,811	2,537,556	1,043,594	1,365,005	2,408,599	1,023,863	1,377,489	2,401,352
University	5,157,341	5,062,801	10,220,142	4,727,588	4,888,032	9,615,620	5,109,666	5,439,804	10,549,470
Total	33,884,484	18,454,688	52,339,172	29,809,917	16,630,015	46,439,932	31,137,441	17,914,009	49,051,450

Source: Stata output from SAKERNAS data

Table 2 informs that workers from the lowest level of education (no diploma) suffer the worst impact in decreasing the number of employments after the outbreak of the Covid-19 virus in 2020 compared to workers who are university graduates who experience the minor consequence of the decline in employment. This result demonstrates that the impacts of the pandemic affect blue-collar workers at the highest degree of severity, where the majority of them come from the low-educated group, and their inflexible occupations cannot be covered by working remotely. Furthermore, the number of men and women in the labor force is nearly equal in the highest level of education (vocational school and university), which agrees with the finding in Wootton (1997) that, in general, occupational differences between genders are lower in the higher level of education. College graduates have a lower degree of occupational gender differences than that secondary school graduates.

Moreover, most female workers are women of higher education levels (vocational school and university graduates), while most male workers are senior high school graduates. A closer look at this reveals that women need to gain a higher level of education to enter the labor workforce because they cannot compete with men to attain lower or middle-class jobs. Similarly, Lain and Cunningham (2021) present that differences between males and females in labor force participation rates emerge when they graduate from secondary school. Marriage and childbirth are the main reasons women are not transitioning into employment. Meeting child care needs and caring for parents impacts women's reduced decisions to participate in the workforce. Meanwhile, men are expected to be sole earners and entirely responsible for fulfilling the needs of their families. The cultural demands urge men to enter the labor market after finishing secondary school.

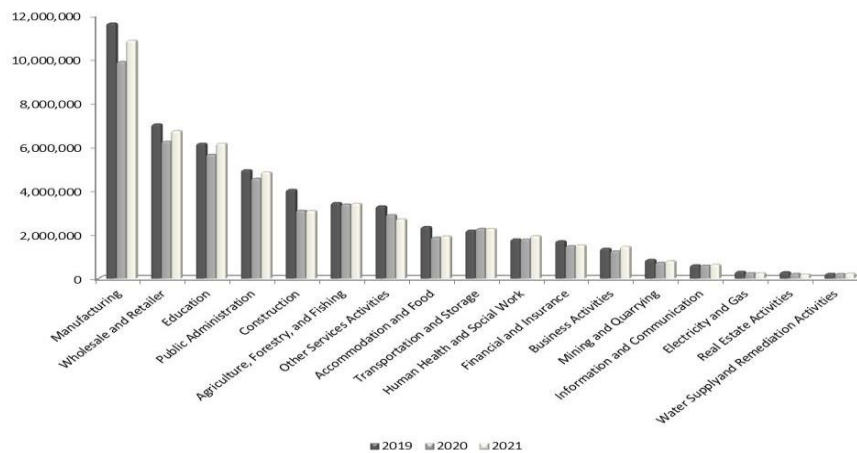


Figure 1 Distribution of Workers in the Labor Market by Sectors 2019-2021

Source: Stata output from SAKERNAS data

Figure 1 shows that manufacturing had the highest number of workers, followed by whole sales and retail trade. After the outbreak of the Covid-19 virus, almost all sector experienced decreasing employment because most factories were ordered to close by the government. In contrast, 'transportation and storage' thrives with an increase in employment after the Covid-19 virus outbreak in resistance to all measures to limit the spread of the virus. Since visiting a shop, supermarket or mall is not possible due to Large-Scale Social Restrictions (PSBB) policy, added to the fact that the operating hours of shopping places are limited, people switch their shopping activities to the online marketplace, e-commerce, and social media. As a result, Hernikawati (2021) observes a noticeable escalation in e-commerce visitors during the Covid-19 pandemic. Her paper reports that the number of e-commerce visitors in 2020 increased by 73.84 percent compared to the number of e-commerce visitors in 2019 which causes a rise in online shopping transactions that induces the expansion of demand for expedition services, packaging materials, and labor for shipping services, therefore, motivates the increasing employment in transportation and storage companies.

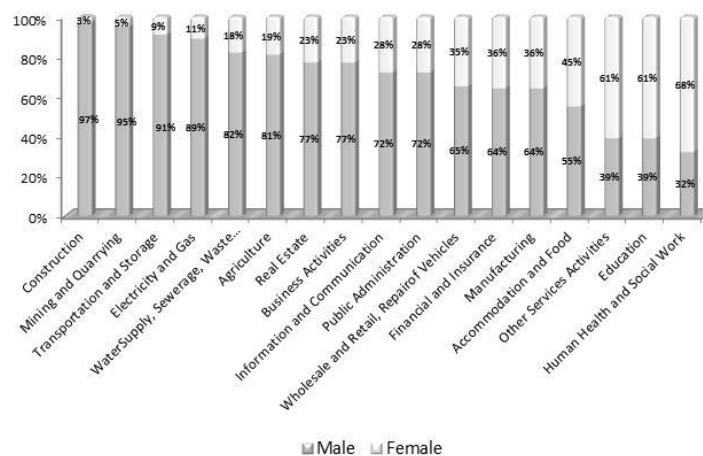


Figure 2 Distribution of Genders in the Labor Market by Sectors 2019

Source: Stata output from SAKERNAS data

Figure 2 shows that men dominated almost all sectors in the labor markets, especially in construction and "mining and quarrying". Meanwhile, human health and social work activities, education, and other services activities are mainly occupied by women. It is assumed to be why women, on average, have a higher education level than men because most women tend to work in the education and human health sectors, which demand high skills. Leuze and Strauß (2016: 816) note that "empirically, women more often perform tasks like 'teaching/educating' and 'healing/nursing/caring,' while men more often perform tasks like 'IT/computing' and 'developing/constructing.'"

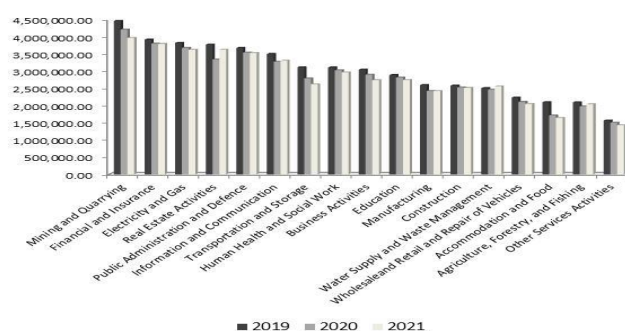


Figure 3 Distribution of Monthly Wage by Sectors 2019-2021

Source: Stata output from SAKERNAS data

Regarding monthly wages, figure 3 indicates that the business sectors that compensate their workers with the highest salary are mining and quarrying, where the employees are mostly men. In contrast, the business sector that gives the slightest compensation is the service industry that women workers represent. Although feminized sectors, particularly education and human health, require high-qualified employees, the monthly wages in these sectors are also considered lower compared to other male-dominated sectors. Globally, empirical studies suggest that women-dominated sectors pay lower wages for both genders who work in the sectors "and contribute to the overall prevailing gender pay gap in the economy" (ILO & WHO, 2022, p. 3).

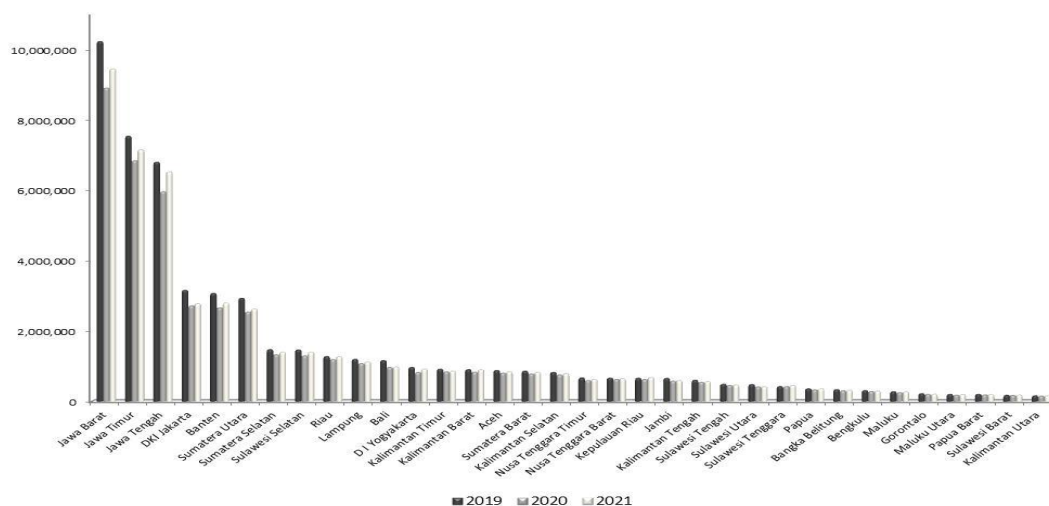


Figure 4 Distribution of Workers in the Labor Market by Province 2019-2021

Source: Stata output from SAKERNAS data

Figure 4 displays that all provinces experience a decline in employment numbers. Furthermore, Jawa Barat, Jawa Timur, and Jawa Tengah have the highest number of workers because these provinces are the most populous province in Indonesia. However, Bali and DI Yogyakarta experience the most severe impact of the Covid-19 pandemic, with a 16.65 percent and 15 percent decline in employment, respectively. Bali relies on tourism for its income; therefore, the travel restriction measure causes much destruction in its economy and worsens its labor market.

Statistics Indonesia (2021) reports that the number of international travelers visiting Indonesia plunged by 75 percent in 2020, and in Bali, the number of visitors dropped by 83 percent. Amrita, Handayani, and Erynayati (2021) argue that the decline in tourism in Bali during the Covid-19 pandemic was the result of the ban on arrivals of foreign tourists, appeals for social distancing, policies of Large Scale Social Restrictions (PSBB) and postponement of the implementation of Meetings, Incentives, Convention and Exhibition (MICE). Therefore, the downturn of the economy in Bali due to the Covid-19 pandemic significantly impacted its employment.

Meanwhile in the "student city" DI Yogyakarta, the boarding house owners suffered from income loss since the government announced the Corona emergency alert by ordering schools and offices to relocate their activities online, resulting in many students and workers who occupy the boarding house leaving the city. Consequently, the landlords no longer have an income to fulfill their needs while they still have to pay the operational cost such as salaries for the employees and monthly bills for their properties. Hence, many

boarding house owners sell their properties at low prices to get them sold right away because they need cash on hand (CNN, 2021). Moreover, the number of tourists in Yogyakarta has dramatically dropped by 83.50 percent after the outbreak of the Covid-19 virus in 2020 (Statistics Indonesia, 2021), resulting in the hotels and guest houses closing and terminating their workers' jobs.

3.2. Wage Determinants

Table 3 OLS Estimation Result for Wage Determinants

Variable	In_MWage	Variable	In_MWage
Year (Base = 2019)		Province (Base = DKI Jakarta)	
2020	-0.0198*** (0.00226)	Aceh	-0.586*** (0.00755)
2021	-0.0313*** (0.00225)	Bali	-0.459*** (0.00820)
Age	0.00424*** (0.000109)	Bangka Belitung	-0.286*** (0.00956)
Gender (Base = Male)		Banten	-0.143*** (0.00800)
Female	-0.240*** (0.00216)	Bengkulu	-0.561*** (0.00977)
Marital Status (Base: Single)		D I Yogyakarta	-0.609*** (0.00960)
Married	0.138*** (0.00230)	Gorontalo	-0.624*** (0.0107)
Living Area (Base = Rural)		Jambi	-0.527*** (0.00879)
Urban	0.0975*** (0.00205)	Jawa Barat	-0.385*** (0.00666)
Education (Base = No Diploma)		Jawa Tengah	-0.595*** (0.00655)
Elementary School	0.133*** (0.00470)	Jawa Timur	-0.590*** (0.00655)
Junior High School	0.269*** (0.00484)	Kalimantan Barat	-0.368*** (0.00814)
Senior High School	0.502*** (0.00464)	Kalimantan Selatan	-0.392*** (0.00823)
Vocational School	0.779*** (0.00646)	Kalimantan Tengah	-0.278*** (0.00822)
University	0.988*** (0.00542)	Kalimantan Timur	-0.181*** (0.00840)
Tenure	0.0191*** (0.000134)	Kalimantan Utara	-0.198*** (0.0110)
Occupation (Base = Manual Labors)		Kepulauan Riau	-0.182*** (0.00914)
Administrative and Managerial Workers	0.572*** (0.00616)	Lampung	-0.544*** (0.00847)
Agriculture, Animal, Husbandry, Forestry Workers, Fishermen, and Hunters	-0.0175** (0.00622)	Maluku	-0.541*** (0.00954)
Army and Police	0.749*** (0.00892)	Maluku Utara	-0.456*** (0.00993)
Assistant of Professional and Technical	0.297*** (0.00482)	Nusa Tenggara Barat	-0.736*** (0.00928)
Clerical and Related Workers	0.237*** (0.00435)	Nusa Tenggara Timur	-0.719*** (0.00826)
Industry and Manufacture Workers	-0.00382 (0.00388)	Papua	-0.137*** (0.00882)
Machine and Equipment Operators	0.223*** (0.00419)	Papua Barat	-0.220*** (0.00949)
Professional Technical and Related Workers	0.317*** (0.00520)	Riau	-0.376*** (0.00800)
Services and Sales Workers	0.0417*** (0.00376)	Sulawesi Barat	-0.713*** (0.0118)
Weekly Working Hours	0.0135*** (0.0000704)	Sulawesi Selatan	-0.647*** (0.00746)
Business Sector (Base = Other Services Activities)		Sulawesi Tengah	-0.599*** (0.00894)
Accommodation and Food Service Activities	0.149*** (0.00651)	Sulawesi Tenggara	-0.633*** (0.00882)
Agriculture, Forestry, and Fishing	0.369*** (0.00566)	Sulawesi Utara	-0.339*** (0.00834)
Business Activities	0.232*** (0.00763)	Sumatera Barat	-0.495*** (0.00785)
Construction	0.426*** (0.00553)	Sumatera Selatan	-0.613*** (0.00784)
Education	-0.257*** (0.00596)	Sumatera Utara	-0.550*** (0.00691)
Electricity and Gas	0.467*** (0.0125)	_cons	13.18*** (0.00992)
Financial and Insurance Activities	0.363*** (0.00741)	N	504084
Human Health and Social Work Activities	0.0276*** (0.00667)	R2	0.407
Information and Communication	0.212*** (0.0107)		
Manufacturing	0.364*** (0.00495)		
Mining and Quarrying	0.567*** (0.00730)		
Public Administration and Defence; Compulsory Social Security	0.121*** (0.00542)		
Real Estate Activities	0.264*** (0.0187)		
Transportation and Storage	0.253*** (0.00637)		
Water Supply; Sewerage, Waste Management, and Remediation Activities	0.210*** (0.0149)		
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	0.222*** (0.00516)		

Standard errors in parentheses

* p < 0.05, ** p < 0.01, *** p < 0.001

Source: Stata output from SAKERNAS data

The OLS regression result in table 3 shows that all model variables are significant in determining the wage rate. On average, the Covid-19 pandemic reduces workers' income for the negative sign in variable year. An additional unit of age, tenure and working hours leads to an increase in wage. Men earn a higher wage than women. Being married is more advantageous than being single because they are entitled to tax reductions for having a family. Wage in urban areas is higher than in rural areas. Wage increase corresponds to education.

"Other services activities" as the baseline group is the sector that is assumed as the sector with the lowest wage. Education is the only sector with a significantly lower wage than the baseline group. This empirical evidence reveals that Indonesia puts education, human health, and social activities sectors as the least important areas for its development compared to other sectors. In addition, these three sectors are dominated by female workers, with women making up more than 60 percent of the workforce. Globally, empirical studies show that female-dominated economic sectors and occupations pay significantly lower wages than male-dominated ones (ILO & WHO, 2022, p. 3). DKI Jakarta, the capital city of Indonesia as the baseline group, is the city with the highest rate of the minimum monthly wage.

3.3. Wage Gap between Genders

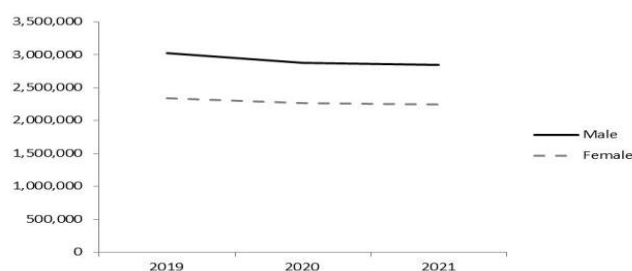


Figure 5 Average Monthly Wage by Gender 2019-2021

Source: Stata output from SAKERNAS data

Figure 5 depicts that, on average, male workers' wage is consistently and significantly higher than female workers, but the wage gap is narrowing from 2019 to 2020, then it will remain the same in 2021. However, men's wages decreased more sharply than women's wages after the outbreak of the Covid-19 virus in 2020.

Table 4 Blinder-Oaxaca Wage Gap Decompositions 2019-2021

In Monthly_Wage	2019	2020	2021
Male	14.66*** (0.00219)	14.60*** (0.00240)	14.59*** (0.00237)
Female	14.28*** (0.00367)	14.24*** (0.00388)	14.24*** (0.00378)
difference	0.380*** (0.00427)	0.357*** (0.00456)	0.352*** (0.00446)
explained	0.0527*** (0.00252)	0.0326*** (0.00267)	0.0403*** (0.00264)
Share in difference	13.87%	9.13%	11.45%
Age	0.00526*** (0.000360)	0.00454*** (0.000342)	0.00549*** (0.000371)
Married	0.0139*** (0.000513)	0.0149*** (0.000565)	0.0136*** (0.000534)
Urban	-0.00712*** (0.000407)	-0.00377*** (0.000342)	-0.00376*** (0.000331)
Education	-0.103*** (0.00154)	-0.119*** (0.00180)	-0.120*** (0.00176)
Tenure	0.0147*** (0.000834)	0.0109*** (0.000846)	0.0104*** (0.000847)
Occupation	0.0379*** (0.000791)	0.0330*** (0.000778)	0.0343*** (0.000784)
Weekly_Working_Hours	0.0911*** (0.00137)	0.0905*** (0.00143)	0.0994*** (0.00148)
Sector	0.000424*** (0.0000794)	0.00145*** (0.000158)	0.00125*** (0.000145)
Province	-0.000185 (0.000234)	0.000190 (0.000156)	-0.0000476 (0.000156)
unexplained	0.327*** (0.00364)	0.325*** (0.00393)	0.312*** (0.00385)
Share in difference	86.05%	91.04%	88.64%
constant	1.021*** (0.0269)	0.905*** (0.0283)	0.973*** (0.0282)
N	180,261	161,172	162,651

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Source: Stata output from SAKERNAS data

Table 4 reports that in 2019, average men's monthly wage was 38 percent higher than women. The wage gap between genders consists of 5.27 percentage points of the explained factor (the endowment effect), and 32.7 percentage points of the unexplained factor. The unexplained factor dominates the source of the wage gap, for its share of the wage gap is 86.05 percent (0.327/0.380), which worsens during the pandemic since it contributes 91.04 percent (0.325/0.357) of the total wage gap.

Furthermore, the explanatory factors of 5.27 percentage points are decomposed by the following variables. The age variable is estimated to explain 0.53 percentage points of the explained factor. Marital status contributes to an increase in the gender wage gap by 1.39 percentage points. Additional years of tenure and working more hours share 1.47 and 9.11 percentage points, respectively, to the wage gap. Variable occupation and sector add 3.79 and 0.04 percentage points to the wage gap. However, the negative sign in the coefficients of living in the urban area and completing a higher level of education estimate the reduction of the wage gap by 0.71 and 10.3 percentage points, respectively. Meanwhile, residing in any province does not have any impact on the wage gap.

The wage gap trends between genders during the Covid-19 pandemic in 2020 and 2021 slightly decreased to 35.7 and 35.2 percentage points, respectively. However, the pattern is still consistent where urban and education variables contribute to reducing the wage gap, while other variables, except the province, add their shares to the wage gap. Moreover, an empirical study by Didier (2021), using Chilean data from the Supplementary Income Survey (NESI) from 1990 to 2018, also finds that expanding access to higher education institutions for women reduces the gender pay gap by 1.9 percent.

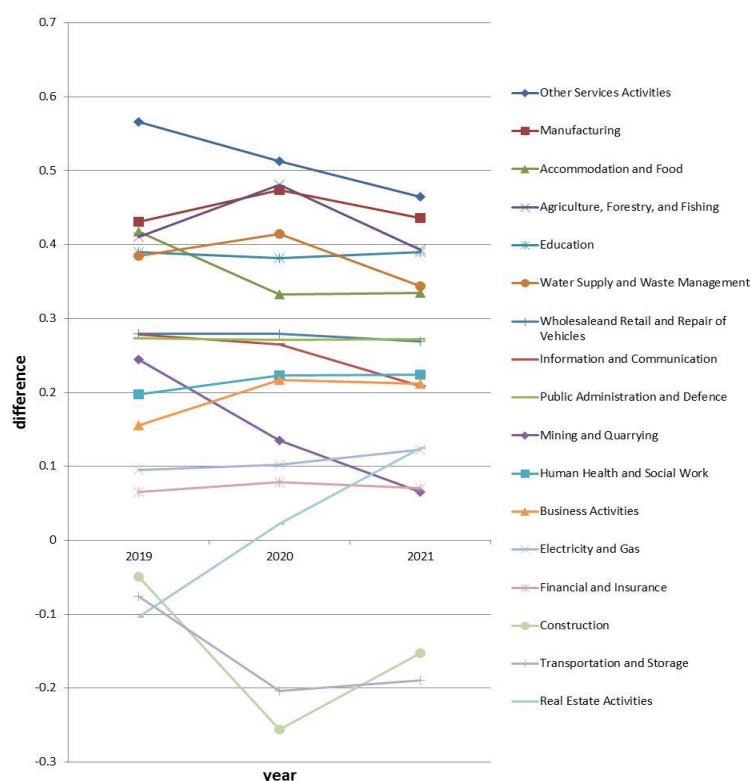


Figure 6 Blinder-Oaxaca's Wage Gap by Sector 2019-2021

Source: Stata output from SAKERNAS data

In figure 6, the Blinder-Oaxaca decomposition of the wage gap across genders by business sector reveals that 'other services activities' is the sector with the widest wage gap, with 56.6 percent consisting of 19 percentage points of the endowment effect and 37.5 percentage points of unexplained factor in 2019. However, the gap narrowed to 51.3 percent and 46.5 percent in 2020 and 2021, respectively, with the proportions of explained and unexplained factors remaining the same. Meanwhile, construction, 'transportation and storage activities, and real estate activities are the sectors where women workers earn more than men. Except for real estate activities which experience an increasing wage gap of 13 percentage points, the other two sectors experience decreasing wage gap of 21 and 13 percentage points, respectively.

Table 5 t-test for the comparison of the Wage Gap between 2019 and 2020/2021 by sector

H ₀	obs	Mean 2019	Mean 2020	Mean 2021	dif	St Err	t value	p value
2019 = 2020	17	0.233	0.22		0.013	0.02	0.7	0.506
2019 = 2021	17	0.233		0.211	0.022	0.022	1	0.332

Source: Stata output from SAKERNAS data

For further analysis, the t-test is used to check a change in the wage gap during the Covid-19 pandemic. Table 5 shows that *the p*-value in both comparisons is insignificant, which means there is no significant change in the wage gap during the Covid-19 pandemic. Thus, the Covid-19 pandemic does not affect the existing wage gap in Indonesia. Nevertheless, the result of this empirical study is not in line with the studies conducted in other countries. In the USA, during the Covid-19 recession female worker suffer more than male worker related to employment loss and income reduction (Albanesi and Kim, 2021). Moreover, in Israel, not only do more women lose their jobs compared to men, women's incomes are more negatively influenced than men's because of the slow economy during the pandemic (Kristal and Yaish, 2020).

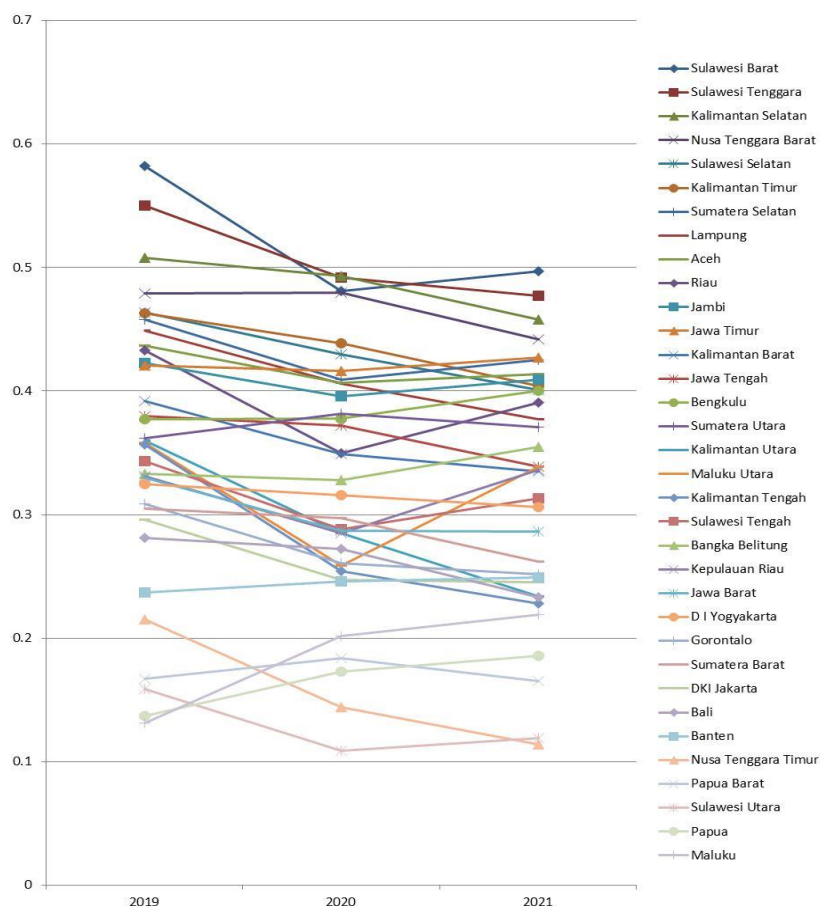


Figure 7 Blinder-Oaxaca's Wage Gap by Province 2019-2021

Source: Stata output from SAKERNAS data

Figure 7 shows that, on average, men are waged higher than women in all provinces since the wage gap signs are all positive. In general, the wage gaps narrowed after the Covid-19 outbreak in 2021, but in 2021 some increased and others decreased. Sulawesi Barat, Sulawesi Tenggara, Kalimantan Selatan, and Nusa Tenggara Barat have the widened wage gap between genders. In contrast, provinces with the narrowest wage gap are Maluku, Papua, Sulawesi Utara, and Papua Barat. The Blinder-Oaxaca decomposition of the wage gap across genders by province finds that Sulawesi Barat has the highest wage gap in 2019 with 58.2 percent with 9.61 percentage points of the endowment effect and 48.6 percentage points of unexplained factor. However, the gap narrowed to 48.1 percent in 2020 and slightly widened to 49.7 percent in 2021.

Except for Sulawesi Tenggara, the provinces with the highest wage differences point to the education sector as the primary contributor to the gap. In contrast, all provinces with the lowest wage gaps hint at the public administration sector as the main generator of wage contrast. According to those as mentioned earlier existing empirical studies in this paper, education is a feminized sector that implies a high wage inequality. Meanwhile, public administration is a male-dominated sector (based on figure 6) in which the employers are mainly government institutions where the wages are regulated relatively based on the occupation and the employee's competencies; therefore, the wage gap in this sector is low.

To further check, the z-test is used to examine whether there is a change in the existing wage gap. Table 6 shows that *the p-value* in both comparisons is insignificant, which implies that the wage gap in 2019, 2020, and 2021 are considered the same. Therefore, it is concluded that the Covid-19 pandemic does not impact the existing wage gap in Indonesia.

Table 6 z-test for comparison of the Wage Gap between 2019 and 2020/2021 by province

Group	Obs	Mean	Std. err.	Std. dev.	[95% conf. interval]	
2019	34	.3574118	.1714986	1	.0212807	.6935428
2020	34	.3269706	.1714986	1	-.0091605	.6631016
diff		.0304412	.2425356		-.4449199	.5058023
diff = mean(2019) - mean(2020)						z = 0.1255
H0: diff = 0						
Ha: diff < 0		Ha: diff != 0		Ha: diff > 0		
Pr(Z < z) = 0.5499		Pr(Z > z) = 0.9001		Pr(Z > z) = 0.4501		
Group	Obs	Mean	Std. err.	Std. dev.	[95% conf. interval]	
2019	34	.3574118	.1714986	1	.0212807	.6935428
2021	34	.3237647	.1714986	1	-.0123663	.6598958
diff		.0336471	.2425356		-.441714	.5090081
diff = mean(2019) - mean(2021)						z = 0.1387
H0: diff = 0						
Ha: diff < 0		Ha: diff != 0		Ha: diff > 0		
Pr(Z < z) = 0.5552		Pr(Z > z) = 0.8897		Pr(Z > z) = 0.4448		

Source: Stata output from SAKERNAS data

4. Conclusions

This study reveals that during the Covid-19 pandemic in Indonesia, many people lost occupations due to the companies' efficiency policy in response to the decreasing demand for their products and services. SAKERNAS data informs that men are more likely to lose jobs than women during the Covid-19 pandemic. Employees' earnings also decrease due to the companies' policy to decline working hours to avoid terminating their workers.

Furthermore, the Blinder-Oaxaca decomposition shows that the wage gap slightly decreases during the Covid-19 pandemic. Furthermore, the most significant wage gaps among sectors in Indonesia are dominated by feminine sectors such as accommodation and food services and other service activities. Meanwhile, construction and transportation, and storage activities consistently paid women higher than men since before the outbreak of the Covid-19 virus because the jobs available for women in these sectors are in a higher level of occupations, such as managerial level, thus, on average women are paid higher than men. Moreover, Sulawesi Barat has the widest gender wage gap, which pays male workers 58.2 percent higher than women. SAKERNAS data shows that the sector with the highest number of workers in the provinces with the highest wage gap is education, which is a feminine sector. In contrast, the sector with the highest number of workers in the provinces with the lowest wage gap is the public administration sector, which government institutions dominate.

Even though, in general, the size of the wage gap decreased in 2020 and 2021 compared to 2019, the results of the t-test on wage gap comparison among sectors and z-test on wage gap comparison among provinces show that there is no evidence that the wage gap across genders changes due to the Covid-19 pandemic. Therefore, the existing wage gap in Indonesia cannot be seen as a minor problem in gender equality. The perpetual inequality issue between men and women in the labor market should be the priority for policymakers to overcome in the future. Further study about the wage gap for each sector must be conducted to examine gender inequality in the labor force. Thus, the measures can be taken precisely since each sector may have its unique problem related to gender inequality in the workforce.

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